



Fig. 2

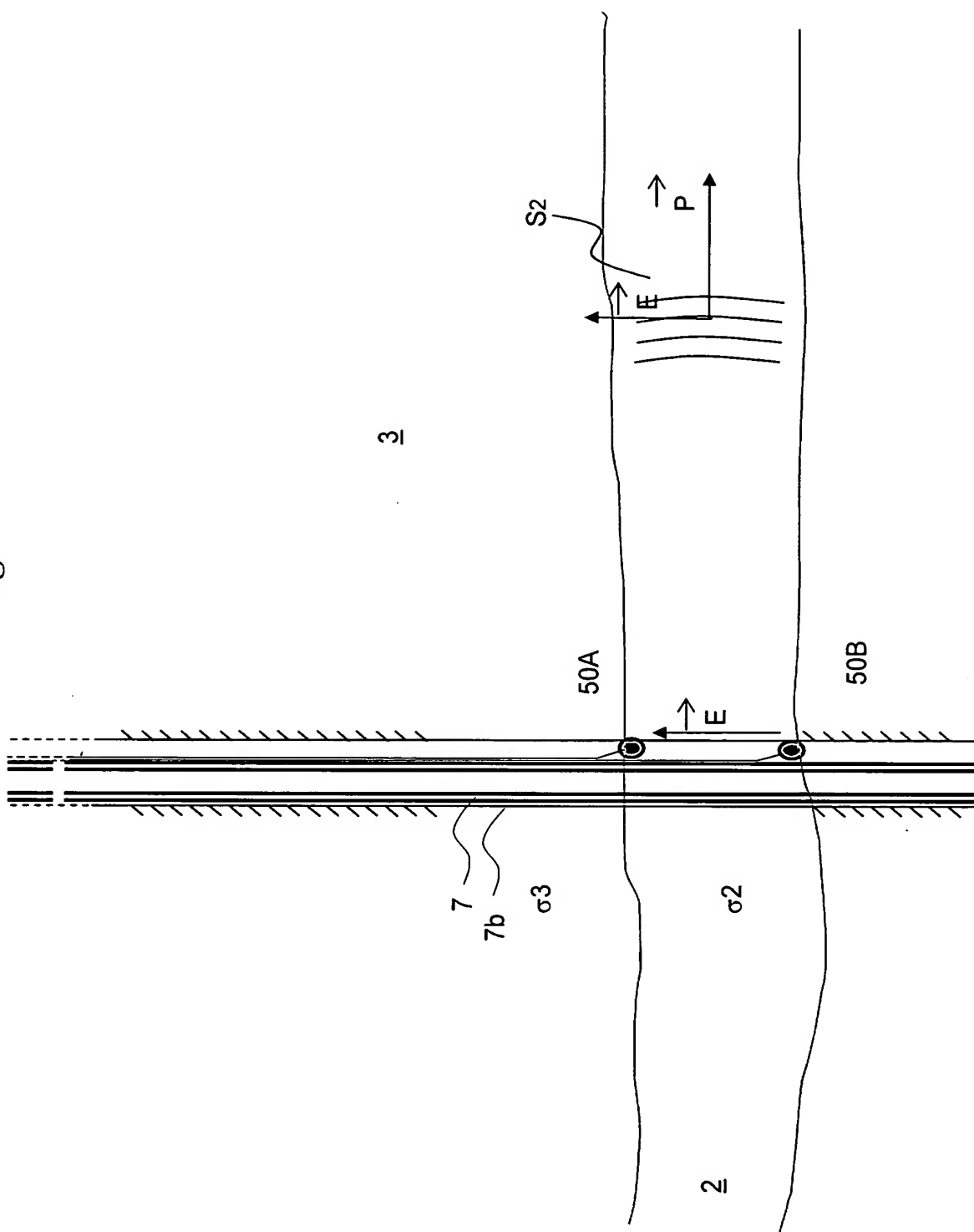
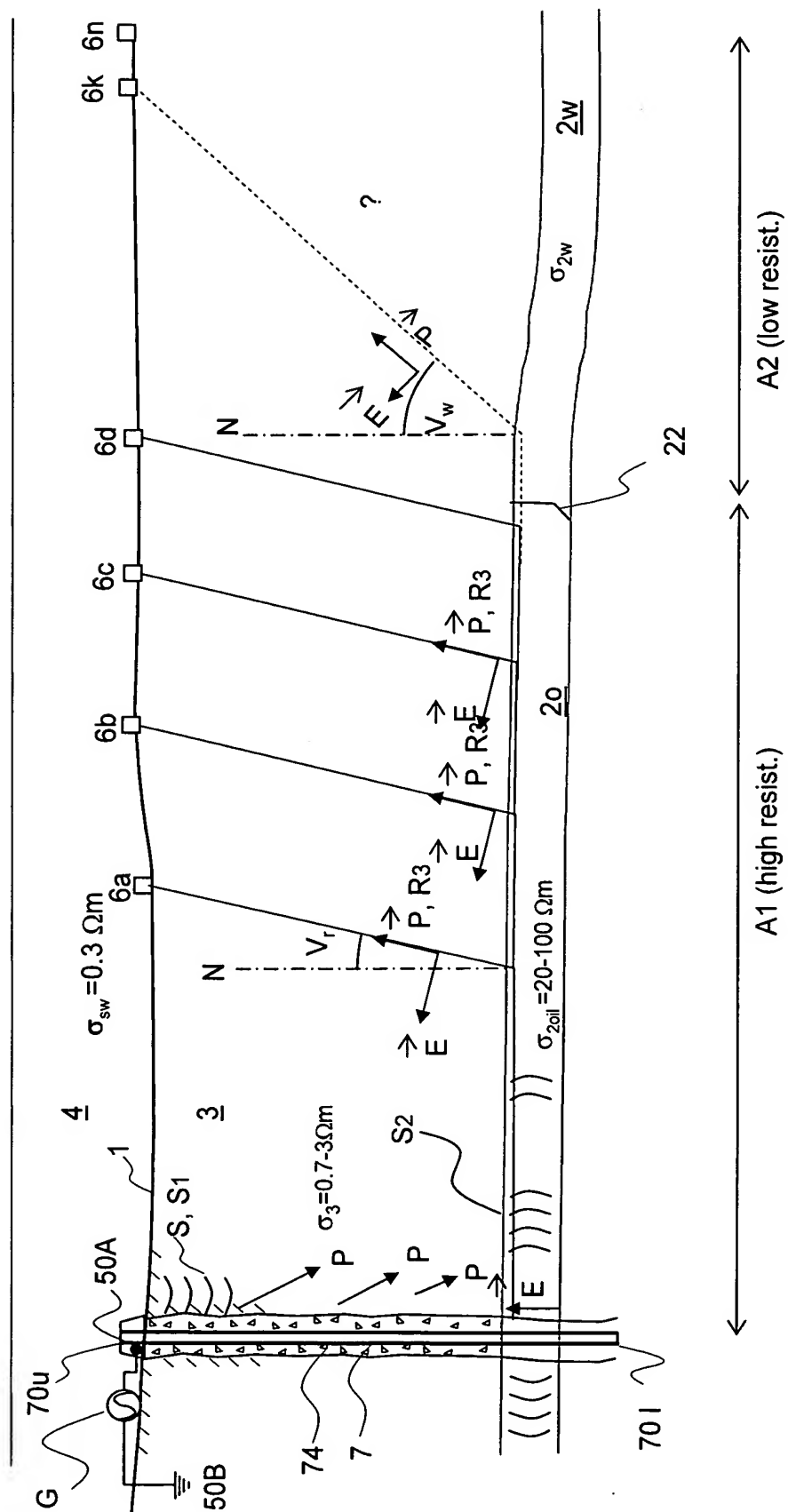


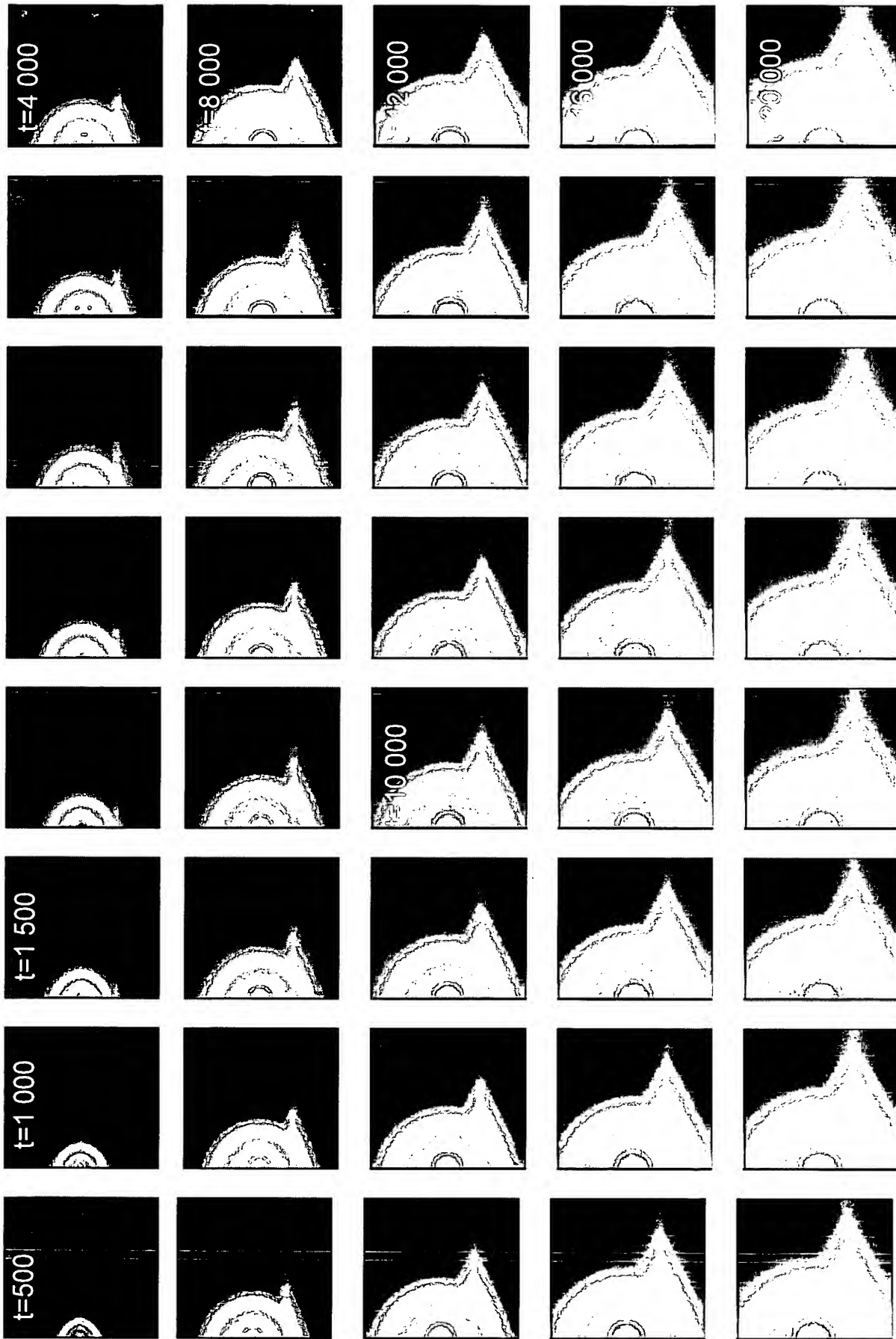
Fig. 3a





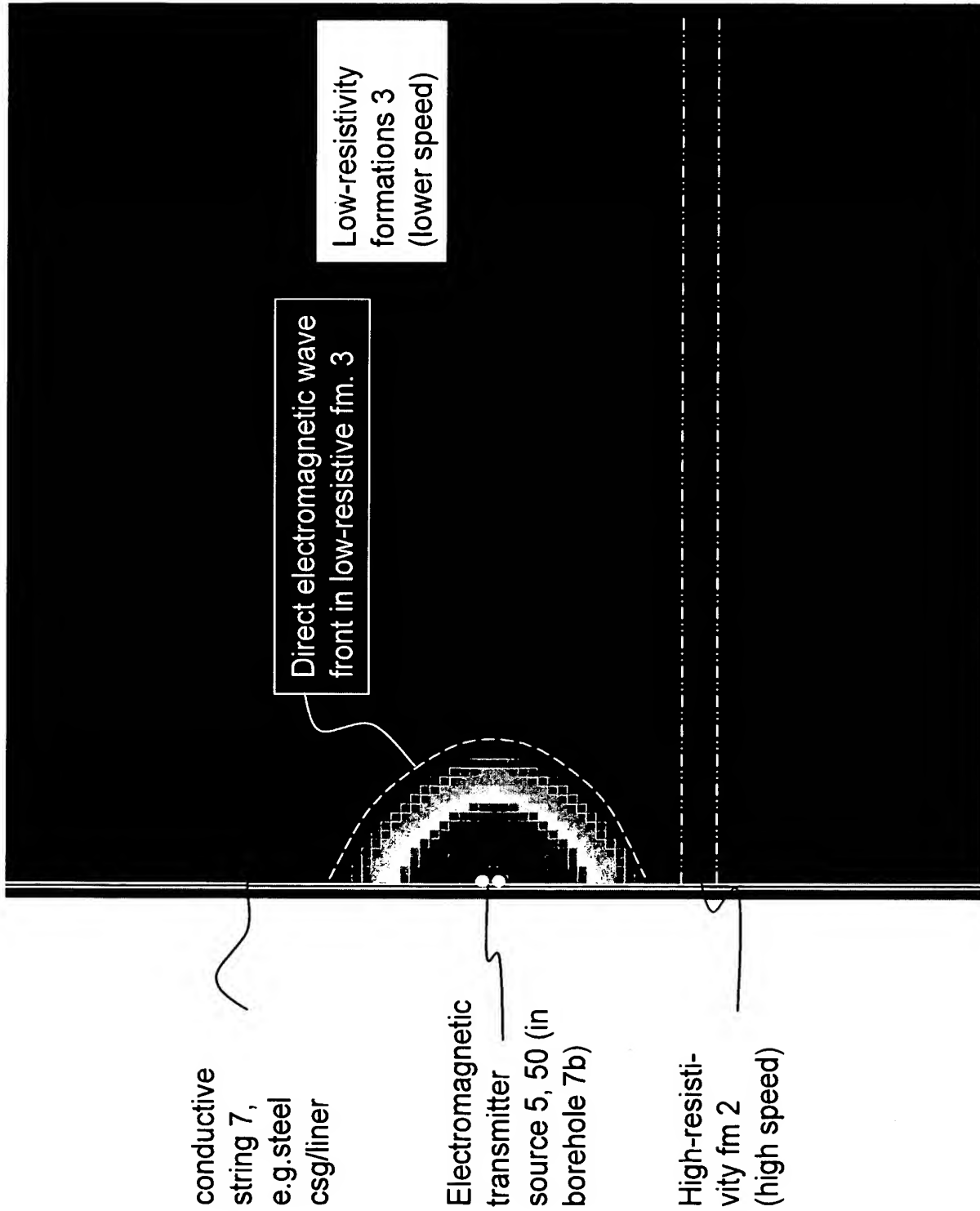






EM wave propagation from 500 to 20000 microseconds.  
Time increment 500 microsec,

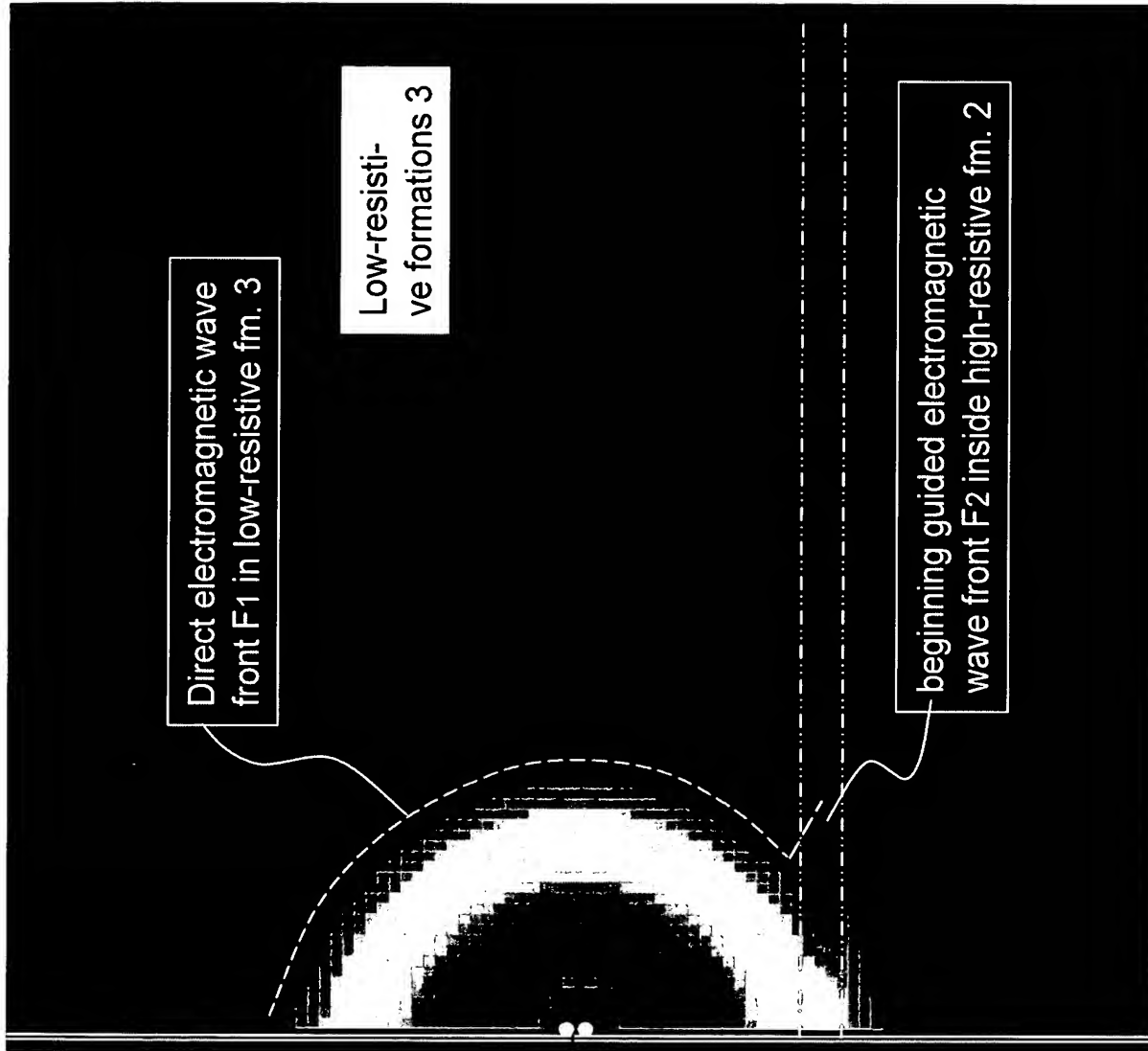
*Fig. 4*



Electromagnetic signal propagated 500 microseconds

Fig. 5





conductive  
string 7;  
e.g. steel  
csg/liner

Electromagnetic  
transmitter  
source 5 (in  
borehole 7b)

High-resisti-  
vity fm 2

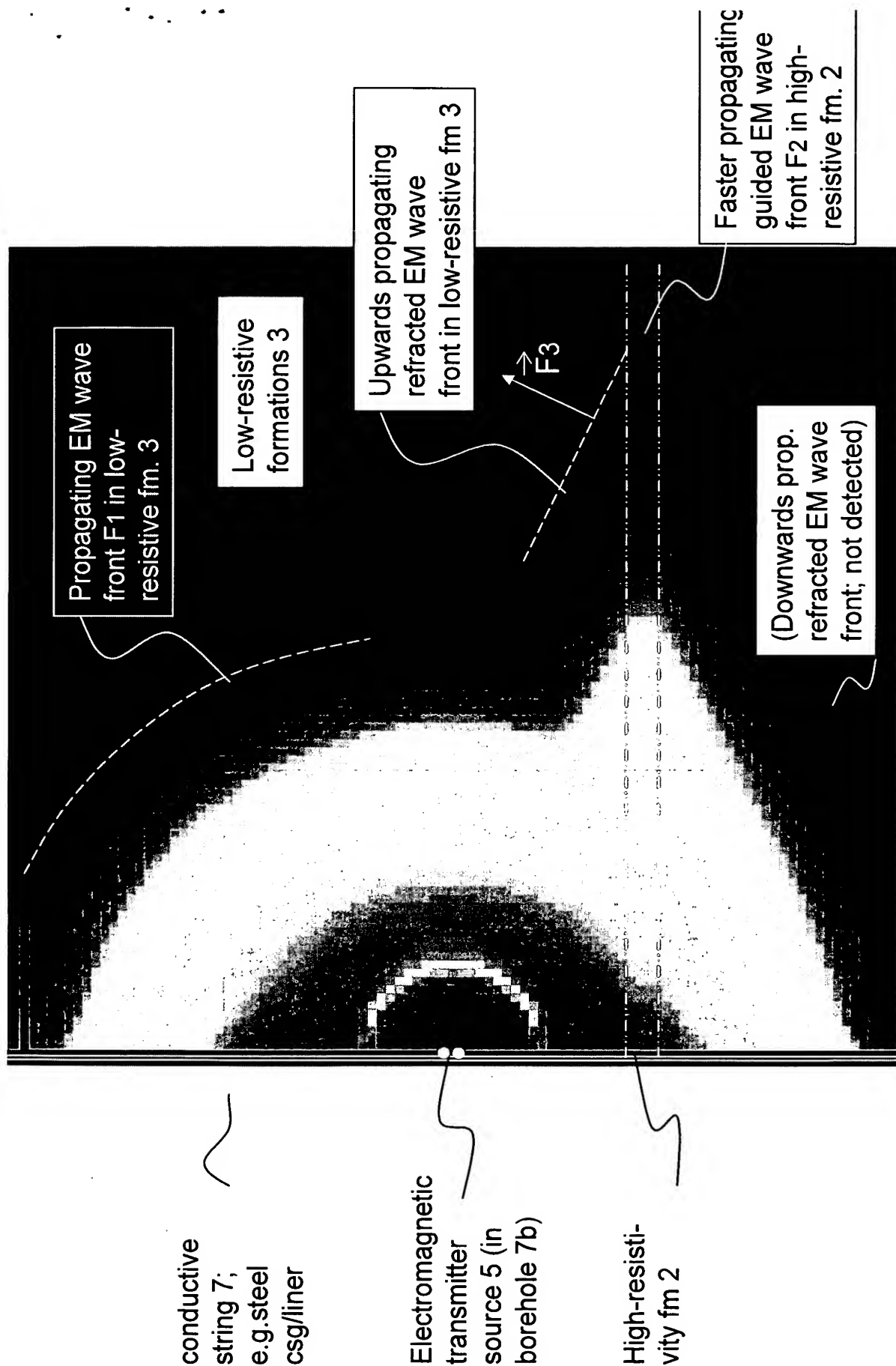
Direct electromagnetic wave  
front F1 in low-resistive fm. 3

Low-resisti-  
ve formations 3

beginning guided electromagnetic  
wave front F2 inside high-resistive fm. 2

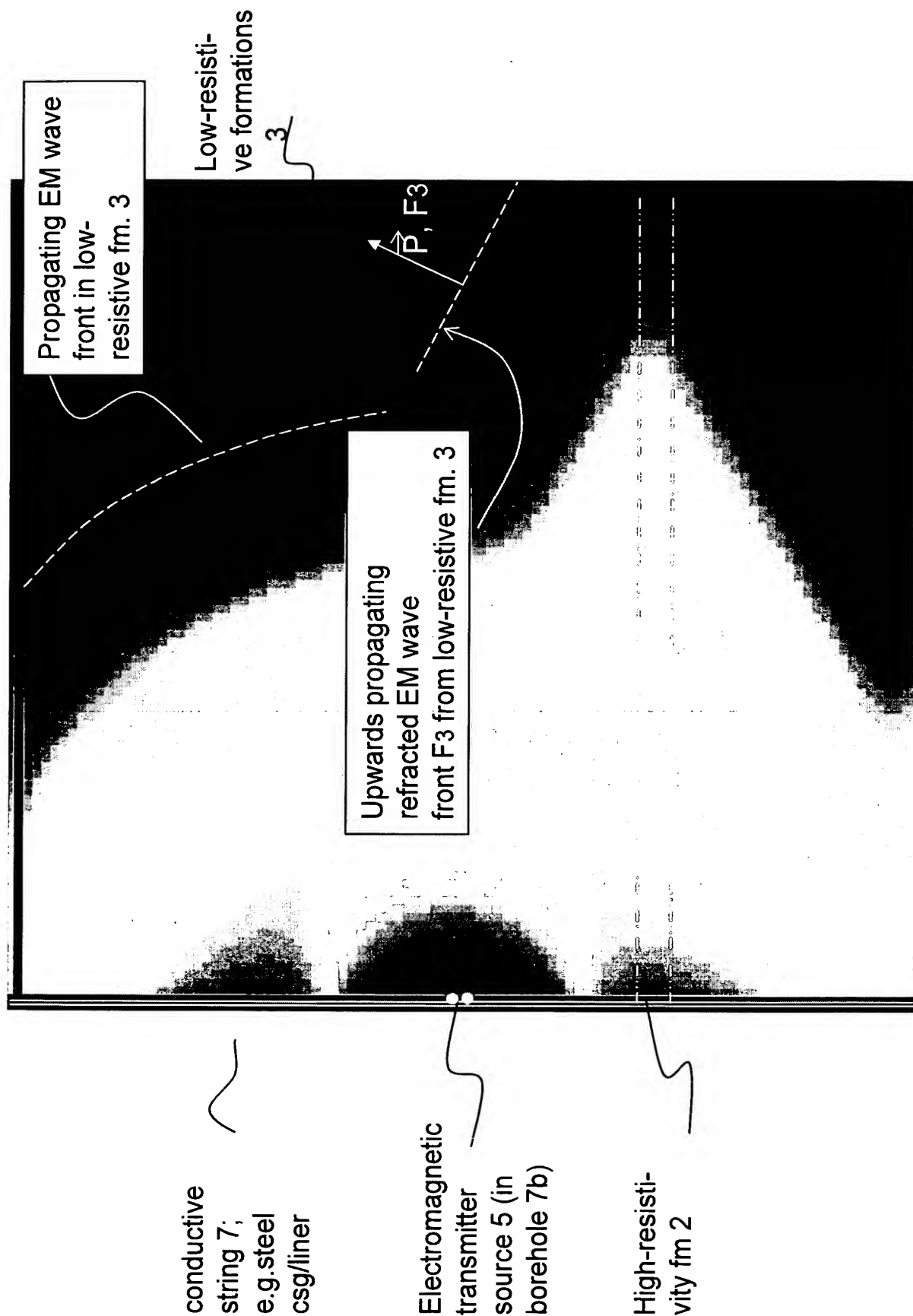
Electromagnetic signal propagated 2 000 microseconds

Fig. 6



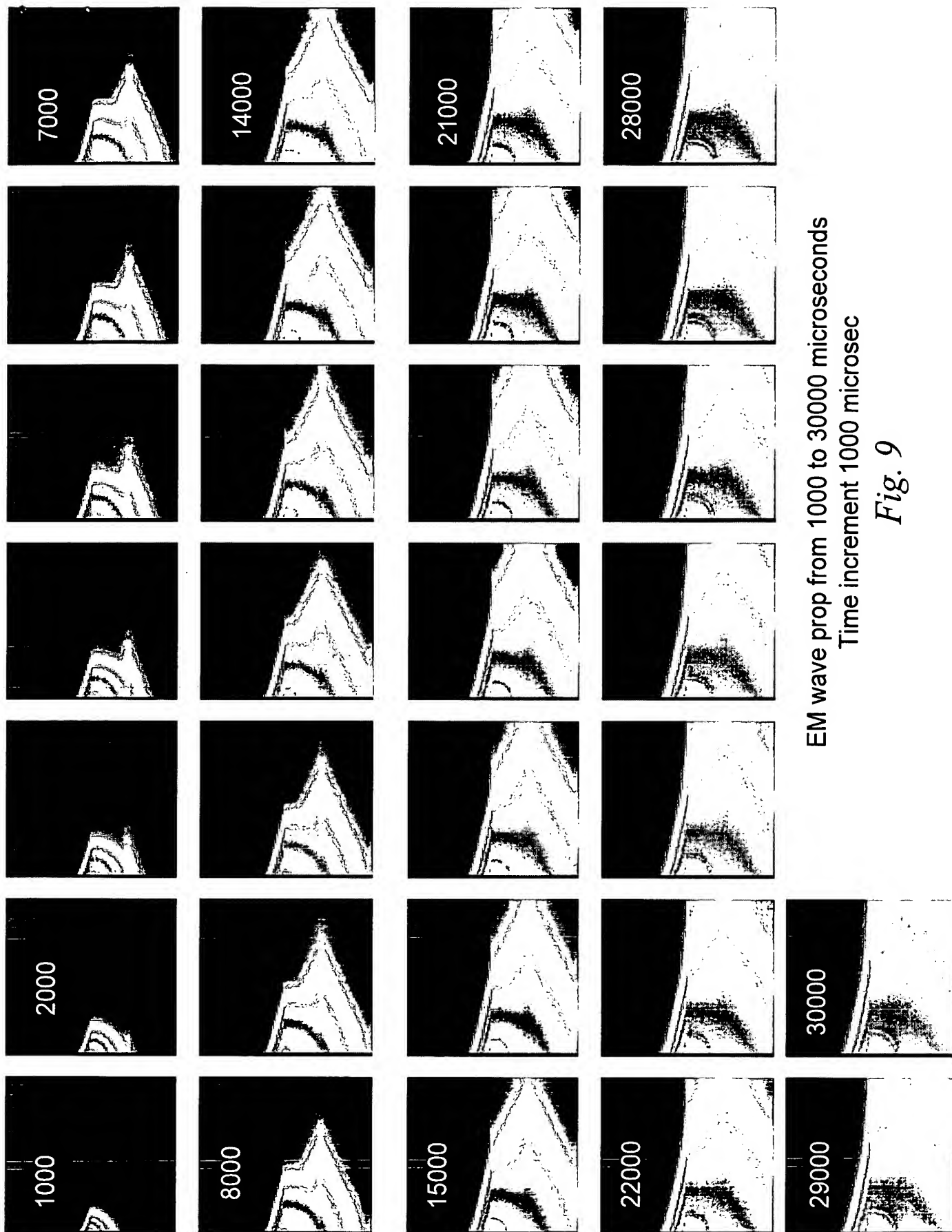
Electromagnetic signal propagated 10 000 microseconds

Fig. 7



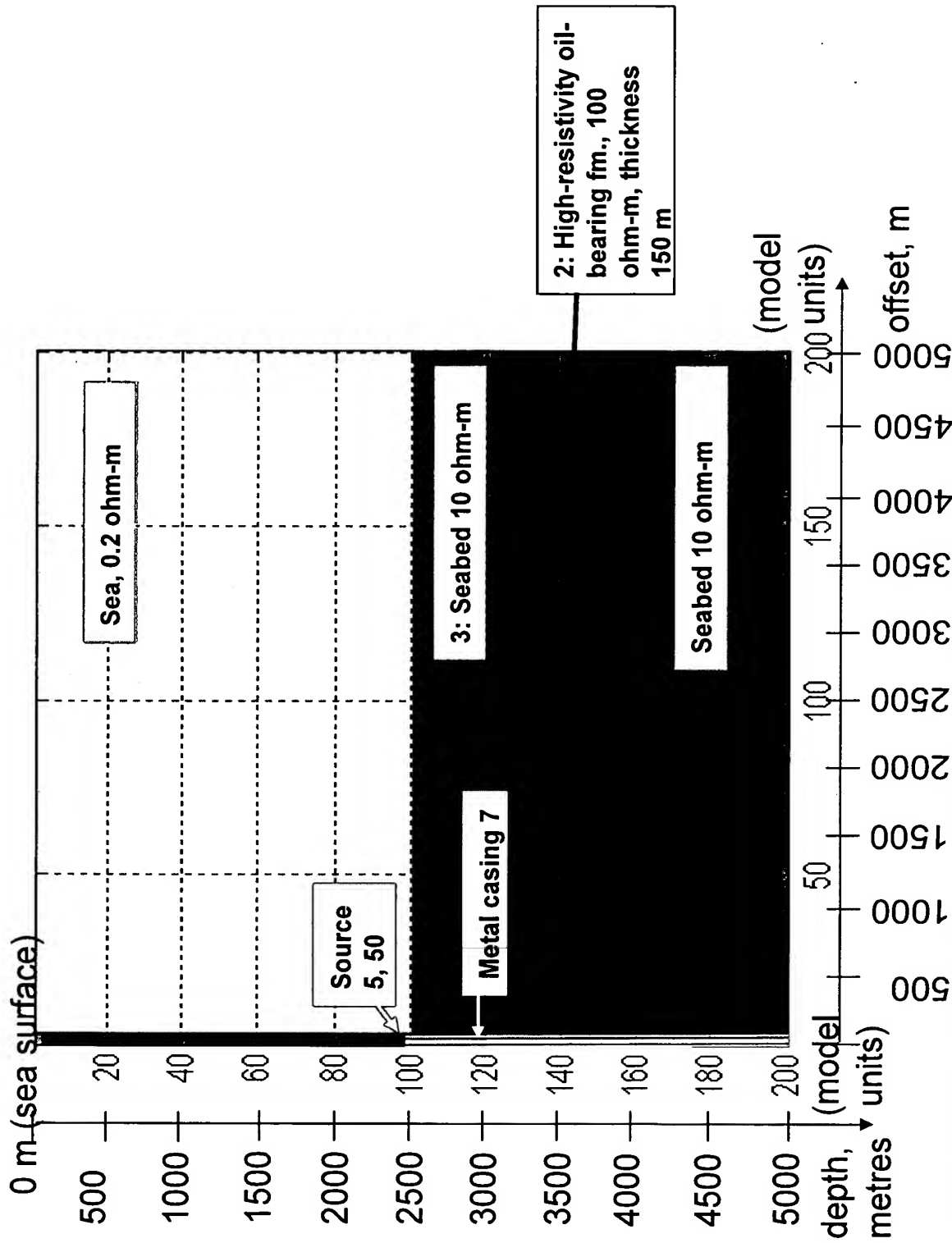
Electromagnetic signal propagated 20 000 microseconds

Fig. 8



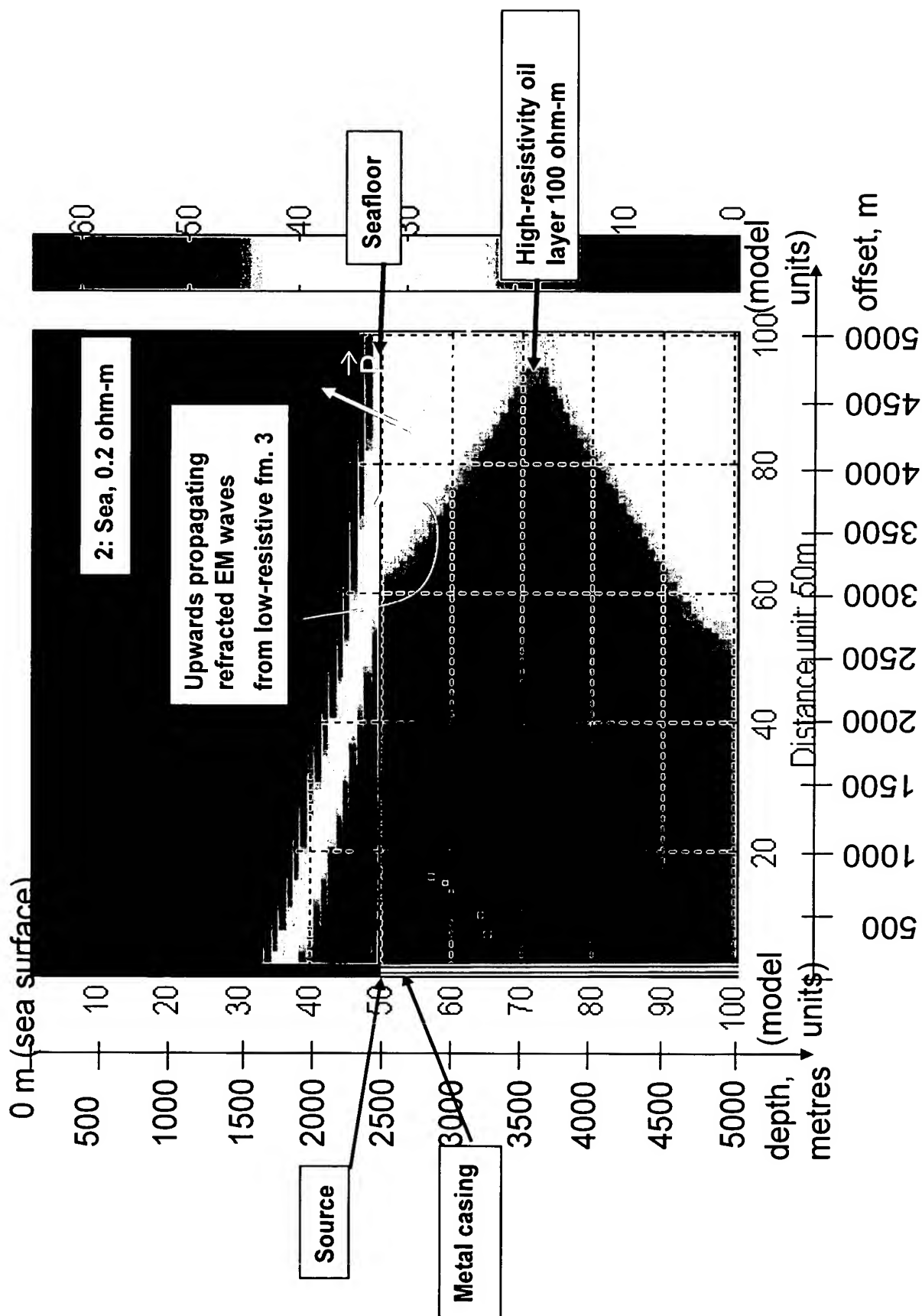
EM wave prop from 1000 to 30000 microseconds  
Time increment 1000 microsec

Fig. 9



The material model of Fig. 9, indicating a metal casing extending from the seafloor at 2500 m to a total depth of 5000 m into the rocks, with an EM transmitter source on the casing at the seafloor. A high-resistivity oil-bearing rock layer is indicated.

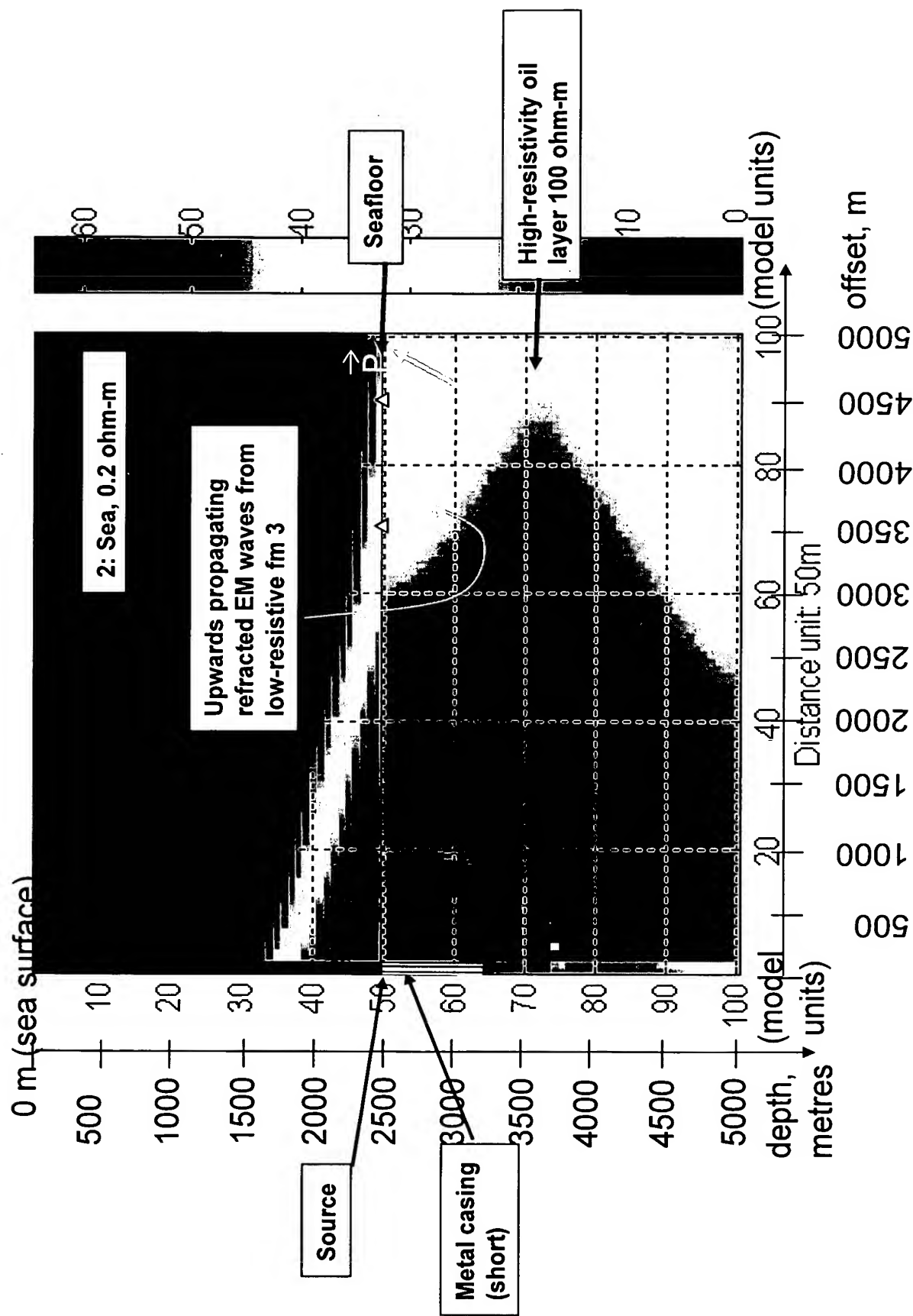
Fig. 9b



The electromagnetic field intensity according to the model of Fig. 9b.

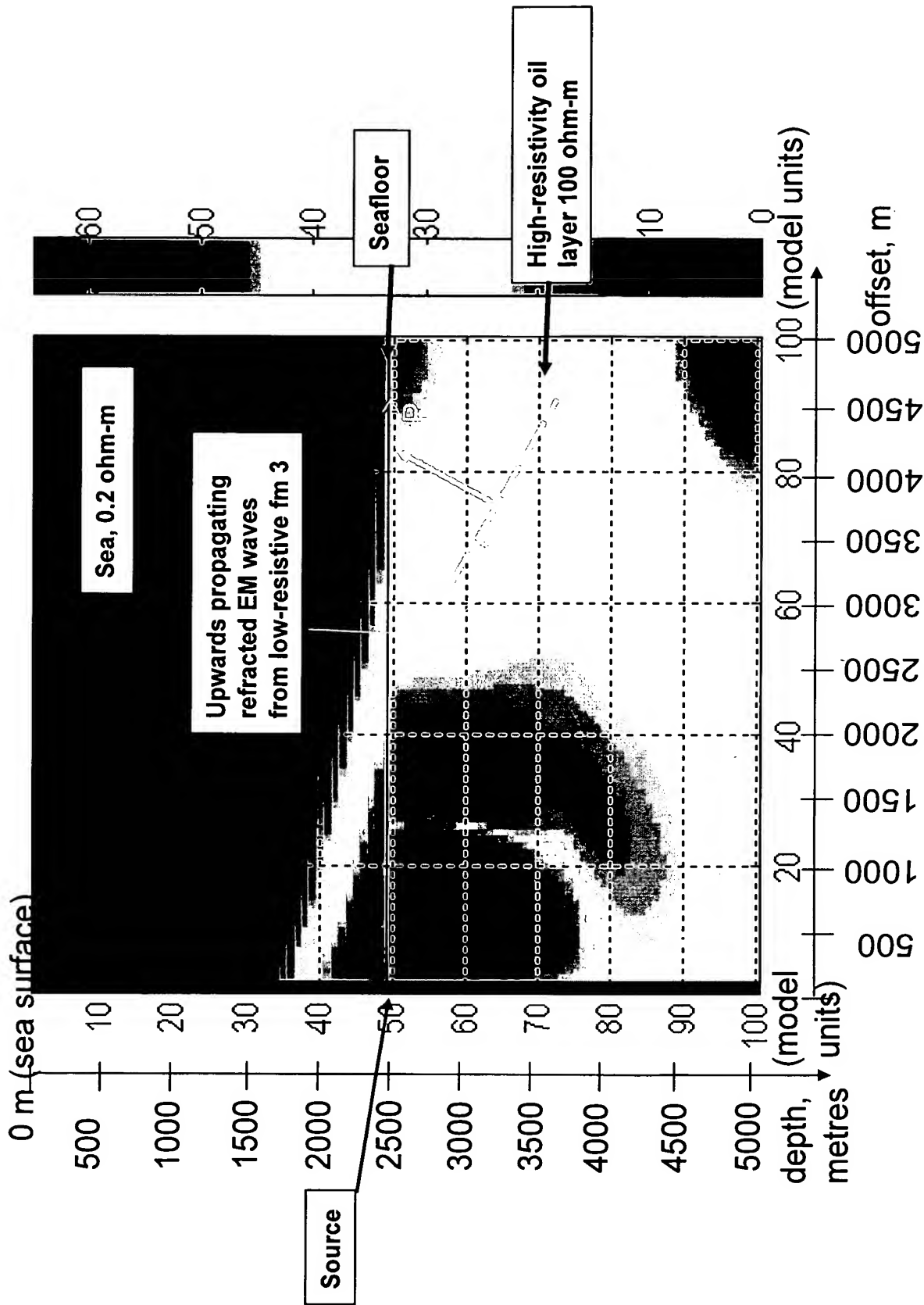
T= 30 000 microseconds.

Fig. 10



The electromagnetic field intensity according to the model of Fig. 9b, except for a short casing that stops at 3000 m depth below sea surface, or 500 m below sea floor.  $T = 30\,000$  microseconds.

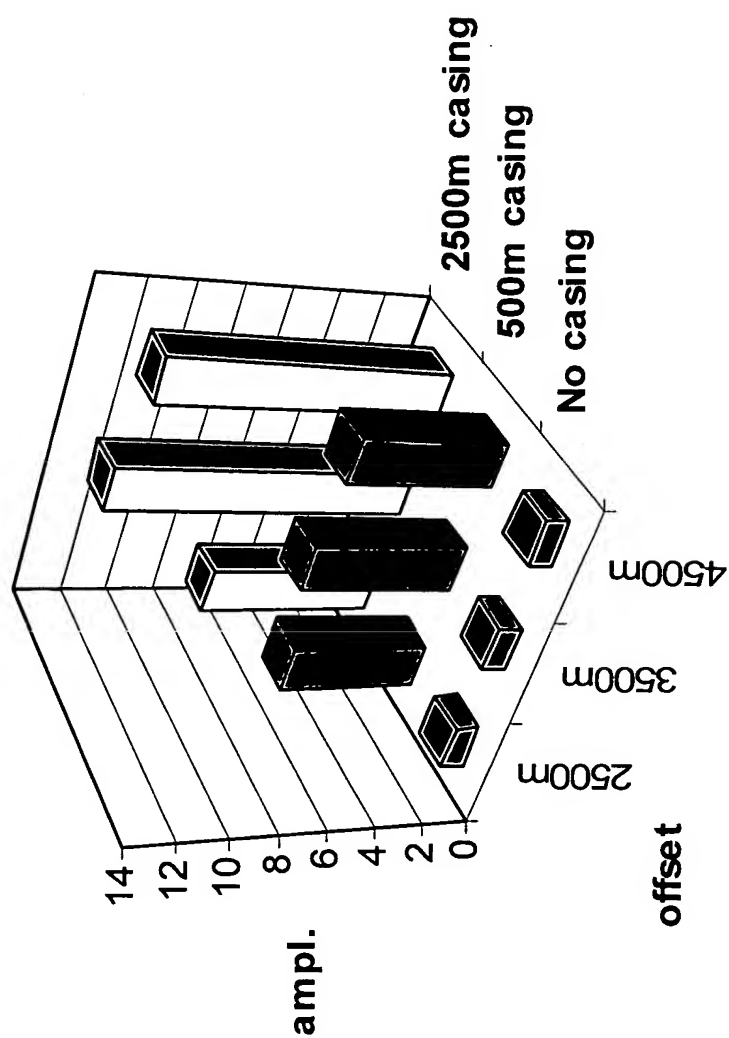
Fig. 11



The electromagnetic field intensity according to the model of Fig. 9b, except there being no casing at all in the well.  $T = 30\,000$  microseconds.

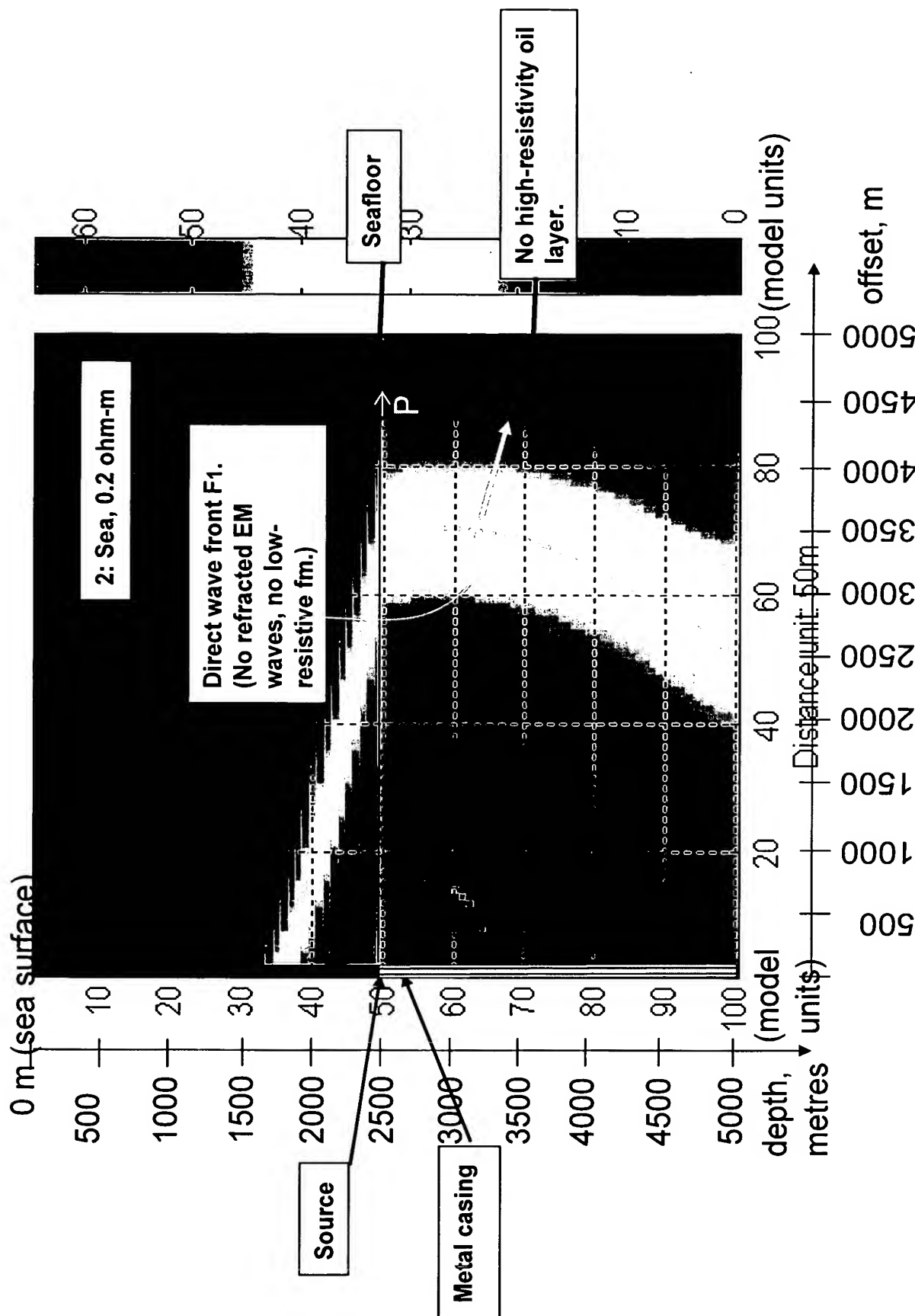
Fig. 12





A comparison between amplitudes as measured at the seabed in the imagined situations of having no casing, a short casing and a long casing.

*Fig. 13*



The electromagnetic field intensity according to the model of Fig. 9b, except there being no high resistivity layer.  
T= 30 000 microseconds.

Fig. 14